Lesson 4: Understanding Web Applications

1. You are developing a Web page for a medium-sized business. You want to separate the formatting and layout of the page from its content. Which of the following technologies should you use to define the formatting and layout of the page content?
a) Cascading Style Sheets (CSS)
b) Hypertext Markup Language (HTML)
c) JavaScript
d) Hypertext Transmission Protocol (HTTP)

Answer: a
Difficulty: Medium
Section Reference: Understanding Web Page Development
Cascading Style Sheets (CSS) help you define the formatting and layout of a page's content and store that separately from the content. HTML is a text-based language that uses various markup tags that describe how content is displayed. JavaScript is scripting language that you use to add functionality and behavior to a Web page. HTTP is the underlying communication protocol used by the World Wide Web.

2. You want to display an image on your Web page. The image is stored on a separate Web server but can be accessed with a public URL. Which of the following HTML tags should you use to ensure that the image is displayed when the user navigates to your Web page?
a) `<LINK>`
b) `<IMG>`
c) `<A>`
d) `<HTML>`

Answer: b
Difficulty: Easy
Section Reference: Understanding HTML
The HTML `<IMG>` tag is used to display the images on a Web page. The source of the image can be on the same or a different Web server. The `<LINK>` tag is used to link a CSS file with the HTML page. The `<A>` tag is used to create anchor links. The `<HTML>` tag is used to specify the contents of a Web page.

3. You are developing a new Web page. You need to create hyperlinks that point to other pages on the World Wide Web. Which of the following methods should you use to create these hyperlinks on your Web page?
a) the `SRC` attribute of the `<IMG>` tag
b) the `HREF` attribute of the `<A>` tag
c) the `HREF` attribute of the `<LINK>` tag
d) the `XMLNS` attribute of the `<HTML>` tag

Answer: b
Difficulty: Easy
Section Reference: Understanding HTML

To create a hyperlink to another Web page, use the HREF attribute of the <A> tag. The IMG tag is used to specify the location of an image. The LINK tag is used to link to a CSS resource. The HTML tag is used to specify the contents of a Web page.

4. You need to perform data validation to ensure that the input fields are not empty and the user's email address and phone numbers have been provided in the required format. You need to minimize the transmission of information across the networks. Which of the following coding approaches should you follow?

a) Use JavaScript code that executes on the Web server.
b) Use C# code that executes on the Web server.
c) Use JavaScript code that executes in the browser.
d) User C# code that executes in the browser.

Answer: c
Difficulty: Medium
Section Reference: Understanding JavaScript
JavaScript is a client-side scripting language that runs inside Web browsers to help create far more interactive Web pages than are possible with only HTML. C# code does not run within Web browsers. Writing code that runs on a Web server increases transmission of information across networks and provides slow response to the users.

5. You write large amount of JavaScript code for your Web site. You need to take advantage of caching techniques to make sure that Web pages load as quickly as possible. You also need to ensure that you can modify the JavaScript code with the least amount of effort. What should you do?
a) Write JavaScript code inside the <SCRIPT> tag. Include the <SCRIPT> within the <HEAD> tag of the HTML page.
b) Write JavaScript code inside the <SCRIPT> tag. Include the <SCRIPT> within the <BODY> tag of the HTML page.
c) Write JavaScript code in a separate file. Use the SRC attribute of the <SCRIPT> tag to link to the JavaScript file.
d) Write JavaScript code in a separate file. Use the HREF attribute of the <LINK> tag to link to the JavaScript file.

Answer: c
Difficulty: Medium
Section Reference: Understanding JavaScript
You should write JavaScript code in a separate file and then use the SRC attribute of the <SCRIPT> tag to link to the JavaScript file. When the JavaScript code is in an external file, it can be cached on the client side and doesn't need to be downloaded with every page. Writing the JavaScript code inside the <SCRIPT> code and including the <SCRIPT> tag within <HEAD> or <BODY> increases the Web page's size and causes the JavaScript code to be downloaded with each page request, thereby slowing down page loads. Using the <LINK> tag will not work because it is used to link to the external CSS file.

6. Which of the following processes is responsible for providing the ASP.NET functionality?
a) inetinfo.exe
b) iexplore.exe
c) aspnet_isapi.dll
d) aspnet_wp.exe

Answer: d
Difficulty: Medium
Section Reference: Understanding ASP.NET Application Development
The aspnet_wp.exe (ASP.NET Worker Process) file handles the Web requests for ASP.NET resources. The ASP.NET ISAPI extension (aspnet_isapi.dll) is responsible for invoking the ASP.NET worker process (aspnet_wp.exe), which, in turn, controls the execution of the request. The inetinfo.exe is the Internet Information Services process. The iexplore.exe process is for the Internet Explorer Web browser.

7. You are developing an ASP.NET Web page that displays status of a shipment. You need to write some code that will change the Web page's appearance and assign values to some controls. Where should you put this code?
a) In the `InitializeComponent` method
b) In a method that handles the `Load` event
c) In a method that handles the `Init` event
d) In a method that handles the `PreRender` event

Answer: b
Difficulty: Medium
Section Reference: Understanding ASP.NET Page Life Cycle and Event Model
The method that handles the `Load` event is the most appropriate place for writing initialization code such as this. You should not be including the Visual Studio `InitializeComponent` method in your code. The method that handles the `Init` event does not have access to the controls because they are available only after the page is initialized. If you write the code in the method that handles the `PreRender` event, any changes to the control's properties do not have a visible effect because the page is already ready to be rendered.

8. You write the following code in your Web page:

```
protected void Page_Load
        (object sender, EventArgs e)
{
    /* additional code here */
}
```

You expect this code to be executed in response to the `Load` event of the ASP.NET page. However, when you request the page, you notice that the method is not executed. What should you do to make sure that the `Page_Load` method is executed when the `Load` event of the Web page is fired?
a) Set the `AutoEventWireup` attribute of the `@Page` directive to true.

b) Set the `AutoEventWireup` attribute of the `@Page` directive to false.

c) Set the `IsCallBack` property of the Page class to true.

d) Set the `IsPostBack` property of the `Page` class to true.

Answer: a

Difficulty: Medium

Section Reference: Understanding ASP.NET Page Life Cycle and Event Model

When the `AutoEventWireup` attribute of the `@Page` directive is set to true, specially named methods such as `Page_Load` are automatically wired up with their corresponding events. When the `AutoEventWireup` attribute of the `@Page` directive is set to false, the `Page_Load` method is not associated with the `Load` event of the `Page` class. The `IsCallBack` property of the `Page` class indicates whether the page request is the result of a callback. The `IsPostBack` property of the `Page` class indicates whether the page request is the result of a post-back operation.

9. You need to display specific messages to the users when their browser is not running JavaScript. Which of the following code segment should you use?

a) `<script runat="server"> … </script>`

b) `<script> ... </script>`

c) `<% … %>`

d) `<noscript> ... </noscript>`

Answer: d

Difficulty: Medium

Section Reference: Understanding Web Page Development

Use `<noscript>` element to display a specific message to users when their browser is not running JavaScript. The `<script>` tag is ignored when JavaScript is not enabled. The `<% ... %>` and `<script runat="server"> … </script>` tags are used only for server-side programming.

10. You are developing an ASP.NET application using C#. On your Web page, you want to display the results returned by a C# method named `GetShipmentStatus` when the page is rendered to the client. Which of the following code segments should you use to call the `GetShipmentStatus` method?

a)
```
<script language="c#" runat="server">
    Response.Write(GetShipmentStatus());
</script>
```

b)
```
<script language="c#" runat="client">
    Response.Write(GetShipmentStatus());
</script>
```

c)
```
<script language="c#">
    Response.Write(GetShipmentStatus());
</script>
```

d)   `<%= GetShipmentStatus() %>`

Answer: d
Difficulty: Medium
Section Reference: Understanding Client-Side vs. Server-Side Programming
The `<%= ... %>` construct is used to display values from ASP.NET code, such as a method call. Using the `<script>` tag is incorrect because this tag is used for defining class-level methods, properties, and variables.

11. You are developing an ASP.NET application using C#. You create a code-behind class named `Status` that contains the business logic. This class is under the namespace Northwind and is stored in a file named status.aspx.cs. You need write the user interface code that uses this class. Which of the following code segments should you use?

a)   `<% Page Language="c#" Codebehind="status.aspx.cs" ClassName="Northwind.Status" %>`
b)   `<% Page Language="c#" Codebehind="status.aspx.cs" Inherits="Northwind.Status" %>`
c)   `<% Page Language="c#" Src="status.aspx.cs" Inherits="Northwind.Status" %>`
d)   `<% Page Language="c#" Src="status.aspx.cs" ClassName="Northwind.Status" %>`

Answer: c
Difficulty: Medium
Section Reference: Understanding ASP.NET Application Development
The `Inherits` attribute in the `@Page` directive specifies a fully qualified name of the code-behind class from which the code should inherit. The `src` attribute specifies the name of the source code file. The `Codebehind` attribute is used only by Visual Studio and is not used at runtime. The `Classname` attribute does not link ASP.Net pages with the code-behind class or file.

12. You are developing a restaurant locator Web site in ASP.NET and C#. As users browse through the Web site, each of the Web pages must display a list of the recently viewed restaurant in the lower left corner. You want this information to be available across Web pages and browser restarts but do not want to use server-side resources to accomplish this. Which of the following state management techniques will help you accomplish this requirement with minimum effort?
a) hidden fields
b) view state
c) cookies
d) sessions

Answer: c
Difficulty: Medium
Section Reference: Understanding State Management
Use cookies because they allow you to store a small amount of information on the user's computer. Hidden fields, view state, and sessions are not correct because these options cannot store information across browser restarts.

13. You are developing an order-entry application that will be used by all employees in your company. You use ASP.NET to develop this application and deploy it on the company's Internet Information Services (IIS) server. What should you install on the users' computers before they can access the order-entry application?
a) .NET Framework redistributable
b) .NET Framework Software Development Kit (SDK)
c) Visual Studio Express Edition
d) Web browser

Answer: d
Difficulty: Easy
Section Reference: Understanding Web Page Development
You need to deploy only a Web browser to access the application. A .NET Framework redistributable is required only when code is executed on the client side, such as in a Windows Forms or a Windows Presentation Foundation (WPF) application. .NET Framework SDK and Visual Studio Express Edition are needed only on the development workstation.

14. You create an ASP.NET Web Service that tracks the shipment of orders. The Web service includes a class named `StatusService`, which contains the following method:

```
public string GetStatus()
{
    /* additional code here */
}
```

You note that you can instantiate the `StatusService` class from a Web service client project, but the `GetStatus` method is not available. What could be the problem?
a) Only properties can be part of the public interface of a Web service.
b) You must mark the method with the `WebService` attribute.
c) The methods of a Web service can return only object data.
d) You must mark the method with the `WebMethod` attribute.

Answer: d
Difficulty: Easy
Section Reference: Understanding Web Service Development
Adding the `WebMethod` attribute to a public method makes it callable from remote Web clients. Methods can be part of the public interface of a Web service. The `WebService` attribute is applied only to the Web service class. You already can instantiate the `StatusService` class, so the `WebService` attribute is not a problem here. The methods of a Web service can return any type of data.

15. You have created a new Web service that provides mapping data. You are working in a Visual Studio environment and use C# as your programming language. You need to test the Web service to ensure that it is returning correct results. What is the easiest way to test your new Web service?

a) Copy and paste the Web service code into an ASP.NET Web Application. Run the Web application to see the results.
b) Invoke the Web service from an ASP.NET client. Run the Web application to see the results.
c) Run the Web services project from within Visual Studio and use the test page that is displayed in the Web browser.
d) Have a large number of beta testers use the Web service and check for incorrect results.

Answer: c
Difficulty: Easy
Section Reference: Understanding Web Service Development
The easiest way to test a Web service is to use the built-in test page that you get when you run the Web service project within Visual Studio. The other answers are incorrect because they require additional efforts to test the Web service.

16. You are developing an ASP.NET application that calls a Web service to retrieve earthquake predictions for a given geographical area. The Web service performs complex, time-consuming calculations to generate the predictions. It is hosted on a government Web server, where you have permission only to invoke the Web service. The users of your Web application complain that the user interface freezes when they attempt to retrieve the predictions. You have full access to the Web server that hosts your ASP.NET application. Which of the following approach should you use to resolve this issue?
a) Move the ASP.NET application to a faster computer.
b) Connect to the Web service over a faster Internet connection.
c) Install additional memory on the Web server that hosts the ASP.NET application.
d) Use asynchronous calls to invoke the Web service from within your ASP.Net application

Answer: d
Difficulty: Medium
Section Reference: Understanding Web Service Development
An asynchronous call to the Web service returns control to users without waiting for the complete execution of the Web service. This approach of invoking Web services helps make the user interface responsive. Having a faster computer or a computer with more memory does not solve the problem because these upgrades to the client computer do not improve Web service performance. Having a faster Internet connection also does not help because the server will still take time to process and return the results.

17. You are developing an ASP.NET application that calls a Web service to retrieve inventory information. You know the URL of the Web service. You need to invoke the methods of this Web service within your Web application. How can you generate the client-side proxy classes so that you can use the Web methods?
a) Use the Web service discovery tool.
b) Copy the .ASMX file from the Web server to the ASP.NET application project.
c) Copy the build output from the Web server to the ASP.NET application project.
d) Set a Web reference to point to the Web service.

Answer: d

18. You are invoking a Web service method that returns an `ArrayList` object. The client application is written in C#, whereas the Web service is written in Visual Basic. The Web service is outside your corporate firewall. You receive an "object not found" error when you call the method that returns the `ArrayList` object but can call other methods successfully from the same Web service. What could be the problem?
a) The client and the Web service are not written in the same programming language.
b) The firewall is blocking all SOAP calls.
c) The client project does not contain a reference to the `System.Collection` namespace.
d) The `ArrayList` class cannot be serialized.

Answer: c
Difficulty: Medium
Section Reference: Understanding Web Service Development
The client applications must contain a reference to the objects that they are going to manipulate. So the client project must contain a reference to the `System.Collection` namespace before it can use a Web service method that returns `ArrayList`. The client and the server code can be written in different languages. If the firewall is blocking SOAP calls, you could not call any methods on the Web service. The `ArrayList` class is marked with a `Serializable` attribute and can be serialized.

19. You are developing an ASP.NET application that uses a Web service created by one of your large customers. This Web service provides you with the `Order` object, which has several properties. The developer of the Web service has informed you that a new property named `Priority` has been added to the `Order` object. What should you do to be able to use the `Priority` property in your code with minimum effort?
a) Create a new ASP.NET application and add a Web reference to the Web service in the new application.
b) Delete and re-create the Web reference in the existing ASP.NET application.
c) Update the Web reference in the existing ASP.NET application.
d) Ask the developer of the Web service for the updated DLL file of the Web service. Add a reference to the DLL in your ASP.NET project.

Answer: c
Difficulty: Medium
Section Reference: Understanding Web Service Development
You should be able to get the `Priority` property available in your code just by updating the Web reference to the Web service. Creating a new client application is not needed. Deleting and re-creating the Web reference is essentially the same as updating but requires

more effort. You don't need to ask for the DLL of the Web service because the code is not executing locally but remotely on the Web server.

20. You develop a new ASP.NET inventory application on the Northwind Web server. You deploy the files in the folder c:\WebInventory. The application should be available via the URL www.northwind.com/inventory. The URL www.northwind.com is already set up to point to the Northwind Web server. What should you do to make your inventory application available at the expected URL?
a) Change the name of the directory c:\WebInventory to c:\Inventory.
b) Create a virtual directory named Inventory and point it to c:\WebInventory.
c) Create a virtual directory named WebInventory and point it to c:\Inventory.
d) Move the directory c:\WebInventory to the c:\inetpub\wwwroot directory.

Answer: b
Difficulty: Medium
Section Reference: Understanding IIS Web Hosting
To have your application available at the expected URL, you should create a virtual directory named Inventory and point it to c:\WebInventory. Just changing the name of the physical directory does not map it to the correct URL. If you name your virtual directory as WebInventory, the application is available at www.northwind.com/WebInventory, which is not what is expected. Moving the WebInventory directory to c:\inetpub\wwwroot does not create a virtual directory by the name Inventory.